

1508866067



UNIVERSITY OF BRISTOL

MEDICAL
LIBRARY



Digitized by the Internet Archive
in 2015

<https://archive.org/details/b21440396>

OF
THE
HOTWELL WATERS,

NEAR
BRISTOL:

BY
JOHN NOTT, M. D.

*O liquidi cristalli, onde s'estingua
L'ardente sete a'miseri mortali!*

TASSO, Del mondo creato. GIORN. 3. STANZ. 18.

BRISTOL:

Printed by S. BONNER, Castle-Green; and sold by J. WALTER,
Charing-Cross, London, S. HAZARD in Bath, BULGIN and
SHEPPARD in Bristol.

ADVERTISEMENT.

TO give a more clear and concise account of the Hotwell Spring, by collecting much scattered information, and by communicating the result of some experience, this little treatise was compiled for the use of its various visitants.

BRISTOL HOTWELLS.

CONTENTS.

WATER IN GENERAL - - - - -	PAGE 1
MINERAL WATERS - - - - -	4
HISTORY OF THE HOTWELL SPRING - - - - -	8
HISTORIANS OF THE HOTWELL SPRING - - - - -	13
NATURAL HISTORY OF THE SITE - - - - -	21
APPARENT AND CHEMICAL CHARACTERS - - - - -	41
NEW DISCOVERED HOT SPRING AT CLIFTON - - - - -	55
HEAT OF MINERAL WATERS - - - - -	57
MEDICAL THEORY OF THE OPERATION OF THE HOTWELL WATER - - - - -	61
APPLICATION TO DISEASES - - - - -	66
EXHIBITION, APPROPRIATE REGIMEN, AND CONDUCT	80
ADVANTAGES OF SITUATION, RECREATIONS, AC- COMMODATIONS - - - - -	92

ERRATA.

Page 72. Line 5. of the Note, for *Lal* read *Lac*.

Page 85. Line 7. for *-ons* read *-tions*.

OF THE
HOTWELL WATERS.

WATER IN GENERAL.

IT is not my design to enter into much preliminary discussion respecting water in general. Whether it be a primitive element, or otherwise, is an inquiry I shall wave; only remarking, how greatly the pride of philosophy must be humbled, when it reflects on the mutability of its boasted laws. What the sages of old, particularly Thales the Milesian, acknowledged as the first principle of things, the "mother of matter," is considered by modern sages as the mere substantiated form, produced by explosion, of two combined airs, the vital, and inflammable.

It is scarce possible to conceive the existence of a truly homogeneous water. That of rivers and fountains partakes of the soil and matter amidst which it flows, or is detained. Rain water abounds with the corpuscles floating in the atmosphere it passes through. Snow water is perhaps of all others the purest. The choice of water then, to which the ancients paid such strict attention, is highly deserving the physician's care: health, and longevity depend upon it.

THE greater the purity of water, the more readily it pervades different substances; and the sooner it is heated, cooled, or even frozen; the softer it is to the touch and taste; the more resonant when poured forth; and the less is its specific gravity. Were water perfectly pure, it would be colourless, tasteless, and inodorous.

WATER is to be considered as the great vehicle of nurture to all productions of the animal, and vegetable kingdoms; the fossil kingdom too could not have birth without it. Below 30° of Fahrenheit's

heit's thermometer water is solid, above that degree fluid, and at 112° it boils. It is uninflam-
mable. Its weight is 850 times that of air, in
which it is very readily soluble. Nothing is more
subtile, except fire. It is a more powerful sol-
vent than we are generally aware of; we know
that flex is often detected on decomposing it.
And it has hitherto been found incompressible.

WATERS not esteemed mineral have custom-
arily been divided into hard, and soft. The fact
is; waters are hard from some slight mineral im-
pregnation, which either boiling, or exposure to
the air decomposes; and they then become soft.

NOR shall I enter into any particular examina-
tion of medicinal mineral waters; their analysis
has been satisfactorily treated upon by that labo-
rious, and enlightened chymist, Sir TOBERN
BERGMAN, whose experiments, and opinions are
well known.

MINERAL WATERS.

Most mineral waters are wholesome and medicinal, adapted to various chronic diseases: they seem gifted by heaven with healing powers, and pointed out by nature as remedies of easy access to man.

A FEW mineral springs are indeed inimical to health, and even poisonous, though but a few. The proportion of warm mineral waters to cold ones is very small. It is peculiar to mineral springs, that they are in general unceasing: they are seldom dried up, but flow the same at all seasons, unchanged in their quantities, or qualities. I know that many waters are said to have more exalted virtues in summer; but this is problematical.

MINERAL waters have by some been considered, and not improperly, as consisting of three distinct principles: 1. The pure elementary menstruum. 2. The matter, of whatever various nature

ture

ture it may be, combined with it. 3. The combining gas.

THE *first* has been spoken to.

THE *second* consists of the following, viz. Metalline substances, which are confined to iron, and copper of the perfect metals: the latter is found rarely, and then only in combination with vitriolic acid: of the semi-metals, zinc and manganese are evident; arsenic is supposed to have been detected. Acids and alkalies, which are said to have been found, in a disengaged state, but generally in union with each other, forming neutral salts; and separately with earths, forming numerous compounds: aerial acid indeed, which we are no longer to consider as air, is found disengaged in waters. Earths perhaps of more kinds than we are aware of: the calcareous is the most common, then the magnesian, next the argillaceous, least of all is the quartzose: terra ponderosa has also been found. Sulphur in the form of hepatic gas, and in combination with alkali forming a hepar.

Fossil oils pure, and in combination, particularly with alkali under a saponaceous form. I cannot dismiss this subject, without observing on that cloud of error which the light of chemistry has pierced. The ancients supposed the saline matter of waters to be a pure acid; even some of our more early moderns have called it invariably an alkali.

THE *third* principle I know not whether it may be perfectly consistent with the doctrines of modern chemistry to admit. That it exists I doubt not, though it be too subtle for experiment to detect. It is that gas which constitutes the difference between constitutional and factitious combination, between the chemistry of nature and of art. It gives to mineral waters energy and efficacy; for, trivial as their contents on analysis may seem, influenced by this principle, they become important and active. Were it otherwise, we might successfully imitate any water, and ascertain its precise degree of power by the proportion of its contents. How sensible an effect will a pint
of

of many aperient mineral waters produce; yet how inactive will be the contents chemically derived from four pints of the same water, and redissolved in one pint of common water: the influence of a peculiar combining principle can alone account for this; and it may be, that some fugitive quality, or matter of medicinal efficacy, is also held in suspension by this same medium, which never chemist yet had knowledge of. Hence it is apparent, that every mineral water should be drunk at the spring, instantly as it is drawn; the slighter the impregnation, the greater the necessity for this; particularly in calcareous and saline waters, whose component parts are more immediately kept in solution by an aerial menstruum.

And here let me express a regret, that the mineral waters of this kingdom are not under the same royal patronage as those of France formerly were. An inspector general was appointed, who analyzed and frequently examined the state of the

different public mineral springs; endeavouring also to discover, if possible, new sources.

HISTORY OF THE HOTWELL SPRING.

THE discovery, and remote history of the Hotwell spring is involved in much obscurity. It rises with force, and perpendicularly, out of the rock on the eastern bank of the Avon, 10 feet above low water, and 26 below high water mark, discharging about 40 gallons in a minute. Mention is made of it, in a mixt language of corrupt latin and french, by William of Worcester, in 1480, as issuing out of Ghyfton cliff, in the shole place; also of the hermitage, and chapel, the dimensions of which are specified, dedicated to St. Vincent, a spaniard martyred at Valencia, A. D. 305. these, he says, were situate mid way on the rock, which was forty fathom from the summit to the main ground below: from the chapel and hermitage to the low water mark was
likewise

likewise forty fathom; consequently, from the summit of St. Vincent's rock to the low water mark must be sixty fathom. The same writer also speaks of the clear spring on the opposite shore in the parish of Lye, under the name of Scarlette Welle. What is now called Giant's hole, in St. Vincent's rock, he describes, under the name of Fox's hole, as of most tremendous access, which in fact it is.

THE earliest traditional account we have of the spring is, that about 160 years ago it was esteemed a specific for the itch and old ulcers, by sailors, who frequently stopped at the native source, when the tide was low, to bathe there.

TILL its present inclosure, it was said to be contained within a brick cistern, the date of whose fabrication is not upon record, 13 feet by 2 square, and 4 feet deep, unpaved at bottom. A wooden pipe 4 feet in length, and 14 inches in the bore, conveyed the water from the southern side of the cistern into a pond 8 feet square. In

this basin, and under this pipe, people washed their faces.

ITS internal use was at first confined principally to nephritic complaints, being esteemed in the beginning of the last century an excellent diuretic. In 1650, it had probably no esteem in phthisis; for Dr. Bennet of Bristol, in his *Theatrum Tabidorum* of that date, does not even mention it. But in 1680, its higher medical reputation, which has been permanent, was established, by curing of a diabetes Mr. Gugg a baker in Bristol, to whom the remedy, according to report, was pointed out in a dream. This circumstance was communicated to the late Dr. Randolph by Mr. Onesiphorous Tyndal, who came to Bristol, in 1674, when the water was only used externally for the itch, and internally for the stone and gravel. Dr. Etwall, a physician residing at Bristol, in 1688, confirmed this story to Dr. Randolph; although, during his day, it merits in the cure of diabetes, or other disorder

had not then rendered the Wells a place of public resort.

IN 1691, Sir John Knight, mayor of Bristol, injudiciously inclosed the spring with a wall of such an elevation as might exclude it from the highest tide. A column of confined water so great, had, by its pressure, nearly forced the spring to find an exit through some new channel; and it was almost lost: but, four years after, the merchants' company, on whose estate the water rises, granted a lease of it at 4*l.* per annum to Jones, Callowhill, and others. They recovered the source, more effectually inclosed it, and put down pumps which now raise the water 30 feet into the present pump-room. Still this inclosure is deficient, and many attempts have been vainly made to remedy the evil. For, at the spring tides, through some defect in the structure, or by reason of some fissure, the tide will at its height come in, and contaminate the spring, which is only cleared by the subsidence of the tide, and by pumping; so that

every fortnight, for a certain portion of the day, the pure Hotwell water is not to be procured.

THESE inclosures however, of such seeming utility at first view, have, in my opinion, disadvantageously influenced, and indeed defeated one of the original medicinal purposes of the Hot spring. Its external use ceases; and its benefits as a bath are no longer considered, which they formerly were, and perhaps with reason. About three years since a bath of the Hotwell water was attempted; but unfortunately the contracted plan on which it was undertaken, rendered it unequal to answer any good medicinal end. It is singular, and it is to be regretted, that neither the Hotwells, nor even the large and opulent city of Bristol, have any establishment of baths. Every medical person, in the course of his practice, must have frequently felt the want of them,

HISTORIANS OF THE HOTWELL SPRING.

THE history of the Hotwell waters naturally leads us to the mention of those who have treated on them. Inaccuracy and error seem to have guided the pens of their earliest writers. We will enumerate them.

DR. EDWARD JORDEN,

OF Bath, in his treatise on mineral waters, 1632, briefly notices them, as ranking with the chalybeate waters of Spa, and Tunbridge.

THOMAS JOHNSON

MENTIONS his having visited the spring in 1634, which was good, he says, for external sores, ulcers in the kidneys, and calculous complaints. See his *Mercurius Botanicus*.

DR. VENNER

IN his third edition only of *Via reeta ad Vitam longam*, 1650, tells us: that, besides their general use in stone, these waters cured ulcers of the urinary passages, and intestines (provided they passed readily) hot livers, inflamed viscera in general, and adust humours. He warns the cold and phlegmatic against using them. He gave them either with sugar, honey, tincture of violets and roses, or cream of tartar. From a dark stool one of his patients voided, he attributed iron to them, also sulphur, and nitre. Their outward use he disregarded.

DR. MAPLET

WRITING to Dr. Bate, 1655, speaks of a cancerous case cured by the external, and free internal use of the water of Bristol, where he resided. In another letter to the Rev. Dr. Creighton, 1668, and in one to Dr. Wall, he extols them in nephri-

tic complaints, drunk largely on an empty stomach.

FULLER.

His Book of Worthies, 1662, relates that: “St. Vincent’s well is soveraign for sores and sicknesses, outwardly and inwardly applied. It has a ferruginous taste; and beer brewed there-with is wholesome against the spleen.” Dr. Samuel Ward, of Cambridge, we find, so drank it for the spleen at great cost, being conveyed, through the Severn and narrow seas, up the river to that town.

CLERMONTIUS

De Aere, Aquis, et Locis Angliæ, 1672, esteems the waters good for obstructed bowels, and the gravel; yet in himself they caused vomiting, which, unless they prove diuretic, they will do, says he, and gripe, or occasion ruptures.

THOMAS GUIDOT

BATCHELOR of physic, practising in Bath, at the end of his discourse on Bathe, and the Hot waters there, 1676, subjoins some inquiries on the water of St. Vincent's rock. He supposes it a continuation of the Bath water thither. One hog-head evaporated produced five ounces and a half of residuum, a fifth of which, he says, was saline matter, containing so much more iron than the Bath water, which is in a greater degree saline. It has, in many diseases, the advantage, and may be as effectual as Tunbridge water. In his epistle dedicatory he tells us; that the principles formerly were accounted sulphur, copper, iron, and a little marcasite.

THE same Guidot, I fancy, in his work: *De Thermis Britannicis*, 1690, retails the doctrines of Venner, and Maplet on this water. He also declares it good in all flatulencies, particularly the *flatus hypocondriacus*, which perhaps he mistakenly deduces from what Fuller had said about the spleen,

spleen. He first recommended it in diarrhæas, and advised bathing in it for the cure of diabetes.

SIR ROBERT ATKYNS

IN his *Account, and present State of Gloucestershire*, 1712, says: "This spring is a remedy famous for " divers diseases, especially the diabetes."

CAMDEN'S *Britannia*, although it speaks of the Bristol diamonds, makes no mention of the water in any edition till that of 1789, which is the last.

MR. JOHN UNDERHILL,

Who practised medicine at Bristol, from a collection of cures formerly kept at the Well-house, makes the water a specific for almost every disease, externally as well as internally used; even king's-evil, and cancer were cured by it. He is the first perhaps who recommended it for sterility, and impotency. See the *Thermalogia Johannis Subtermontani*, as he styles himself, 1703.

DR. WYNTER

To oblige Dr. Friend with a comparison between the Bath and Bristol waters, wrote, during a four weeks' voyage from Jamaica, his *Cyclus metasyncriticus*, 1725. There is found a history of the numerous virtues of Bristol water; the most novel is that of curing dropfies. In the modern language of medicine, the Dr. considers Bath water as a stimulant, Bristol water as a sedative.

DR. MEAD

CANNOT perhaps be considered as a writer on the Bristol water; yet he has greatly enhanced its reputation, by his recommendation of it in diabetes. He justly considers it as a light lime-water.

DR. KEIR

THOUGH his doctrines and opinions, medically and chemically considered, are now somewhat obsolete,

obsolete, has treated the subject of our water with much method and perspicuity. Upon the whole, I consider his treatise as the best yet written concerning it. It came out 1739.

MR. SHEBBEARE

UNPARDONABLY as a chemist, deduces all he would prove from analagous experiments; on the suppositious principle of alum and lime-water curing diabetes. His *Analysis* came out 1740.

DR. RANDOLPH

FIRST published his book 1745. He enters but little into the history, and no way into the chemistry of the Bristol water. He chiefly treats on the diseases to which he considers it applicable; these are: Hectic fever, Hæmorrhage, Dysentery, Uterine bleedings, Hectic from increased circulation, Scurvy, Hectic from ulcer, Diabetes, Gleets, and Phthisis pulmonaria. He republished his work in 1750, with the chemical part ad-

ded, which however contains no experiments of his own.

DR. SUTHERLAND,

OF Bath, is the last writer on this water. His treatise, which appeared 1758, has been recently reprinted. Could I have bestowed praise upon it, I might have spared myself the trouble of compiling the present. His book abounds with cases, which, in my opinion, stamp no credit on a medical performance, the use of them being so generally abused. He seems the professed antagonist of Randolph,

DR. FOTHERGILL

UGHT possibly to be ranked among the writers on Bristol water. Simplicity, candour, and sound sense characterize the few pages concerning them which he inserted in the 5th Vol. of *Medical Observations and Inquiries*. They constitute an ele-

gant, compendious, and, I had nearly said, a perfect treatise.

NATURAL HISTORY OF THE SITE.



THE nature of the rock out of which St. Vincent's spring issues, and the circumjacent soil, cannot but interest us. The rock in general is a limestone, whose colours are beautifully varied; a dusky red, yellow, and grey are the prevailing. In parts it is so hard as to deserve the name of marble, bearing a very high polish, and being applied to ornamental purposes; a brown kind veined with red is the most esteemed: some of the darker veins, struck with iron, emit a fox-like fetor. No calcareous earth makes better lime. The strata in general decline south: in their fissures are found sparry and calcareous crystals, particularly those so well known by the name of Bristol diamonds: they are found also in nodules amidst the neighbouring fields: they are often colourless;

often of a brownish red, purple, or yellow. Marine exuviaë, and fossil corals are likewise numerous. But, to gratify the mineralogist, a list of the most material fossils hitherto got on the spot, and in that vicinity of Bristol, shall be presently exhibited.

NOR are the bowels of the earth here deficient in metalline productions: iron, and lead are found; so is zinc in its ore of calamine, of which there are many works at no great distance.

THE earth that chiefly abounds is ochreous, of a various red and yellow: but the soil which covers the summits of these rocks, extending over fine downs on either side the river, is a rich black mould, spread with a dry turf, bearing heath and odoriferous herbs in abundance. About St. Vincent's rock grow a variety of curious plants that are peculiar to the spot. A more correct list of them, in my opinion, cannot be formed than what the ingenious Dr. Broughton, late of Bristol, made out, which Shiercliff's Hotwell Guide has copied.

I will give it a place after the Fossil list, for the sake of my botanical readers.

To the luxuriant herbaceous productions of meadows and gardens, in the vicinity of the Wells, which are numerous and highly cultivated, as also to the neighbouring lime-kilns, Dr. Keir has wrongfully attributed the wholesomeness of our air: and he adopts the vulgar opinion, that aromatic plants give sweetness to the milk of animals. We know that their oil is too caustic, to allow them to be food for brutes; but the short blades, that spring on the soil these plants inhabit, form the sweetest pasturage possible.

CERTAIN it is, that air, which blows over tracts of vegetation, is warmer and more salubrious, than what blows over uncultivated or unproductive soils; whether it be, that it is impregnated with a peculiar matter which vegetables are said to perspire, and which is friendly to the lungs of all animals, but chiefly of man; or whether it be, that it is wholesome from imbibing, according to more
modern

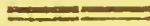
modern doctrines, an oxygenous principle which vegetables readily impart, and so vivifying our respiration in a higher degree; this I am not competent to decide on. I know from experience, that a situation among the pine-clad mountains of the south of France, as that of Hieres, is far preferable for our emigrating invalids, to their more southern resorts of Nice, Pisa, and Naples, where both mountain and plain are always less clothed, and oftentimes bleak and barren.

BUT a survey of the country, and a little reflection will unfold the secret of salubrity in the air about St. Vincent's rock, and point out in what it consists. South west of the river, from the height of its wooded side, forming the edge of Leigh down, extends the rich tract of Clevedon down for about sixteen miles, till you come to Walton upon the Severn coast, which river has there all the properties of sea; yet our mariners do not admit the appellation of Severn-sea, till you reach Cardiff. It is easy to conceive, how the sea breezes coming to us over the high land of Clevedon

don

don down, and blending with its air, must influence the atmosphere of St. Vincent's rock; not to mention the portion of sea air that comes to us each tide by the channel of the Avon from King-road. The fact then is; we here breath a light sea air tempered with a soft dry mountain air. What can we conceive more mildly tonic, and more salubrious?

LIST OF FOSSILS FOUND UPON, AND IN THE
VICINITY OF ST. VINCENT'S ROCK.



St. Vincent's rock contains

CALCAREOUS EARTH,

Combined with Aerial acid.

Solid fine-grained Limestone.

Black compact Limestone.

Calcareous [Spar of a rhomboidal figure, and diaphanous.

Foliated Spar.

Pyramidals.

Dogs' teeth. Several varieties.

Stalactitical Spar; solid, and hollow in the form of a cone.

Many of the Limestones on collision smell like Lapis fuillus.

Imbedded in the Limestone are found many organic bodies, such as Univalves, Bivalves; also Madreporas, Milleporas, Astroites, and a great variety of the Coral class, many of which are peculiar; being found, in their native state, only in the East Indies.

Kitton-stone or Hammites is likewise abundant in the Limestone.

QUARTZ,

Constituting a part of St. Vincent's rock, is found

Solid,

Solid, frequently imbedded in limestone indurated by iron.

Crytstalized, chiefly in hexagonal crytstals with frequent shoots of iron.

In the form of Nodules.

As a Jasper, red and yellow; of which both a coarse, and a fine-grained sort are found upon, and in St. Vincent's rock.

IRON

Is found in great abundance in the form of
A brown Calx, which is partly phlogisticated,
and magnetic.

Red Calx, more dephlogisticated.

Stalactitical.

Crytstalized.

Hæmatites.

Magnet.

Black iron Ore, with very little Sulphur.

LEAD, AND LAPIS CALAMINARIS.

They are sometimes found on St. Vincent's rock, and on Durdham down.

LEIGH-DOWN contains most of the fossils found about St. Vincent's rocks.

KINGSWESTON produces large nodules of Quartz crystals, in some are found the rhombic calcareous Spar, and in others Gypsum with Quartz crystals imbedded.

AT SHIREHAMPTON are found in the gravel-pits many organic bodies, as Cornu ammonis, Vertebræ, Horns of unknown animals, &c.

AUST-PASSAGE affords an abundance of Calcareous earth combined with Vitriolic acid. A great deal of Iron mineralised with Sulphur and Arsenic, and a variety of organic fossils.

COTHAM-HILL contains many large Bivalves natives of the East Indies, and Pacific Ocean, ^{also} the Cornu ammonis, &c. The Cotham Marble is in the

the form of Stalactite; it is a Marle indurated by Iron, which produces its landscape.

LIST OF PLANTS FOUND IN THE VICINITY
OF ST. VINCENT'S ROCK.

ÆGILOPS (NOW ROTTBOELIA INCURVATA;) *Sea Hard-grass*. By the river side. June to August. Hist. Oxon. viii. 2. 8.

ALOPECURUS PANICEUS. *Bearded Fox-tail grass*. St. Vincent's rock. June to August. Schreb. 20. 3.

ANETHUM FENICULUM. *Fennel*. St. Vincent's rock. July and August. Sheldrake. 15.

ANTIRRHINUM CYMBALARIA. *Ivy-leaved Toad-flax*. Walls about Clifton. June to September. Fl. Londinens. 1. 10.

ANTIR-

ANTIRRHINUM, MINUS. *Leaf'd Toad-flax.* St. Vincent's rocks. June to September. Fl. Londinens. v. 50.

AQUILEGIA VULGARIS. *Columbine,* St. Vincent's rocks. June. Fl. Dan. 695.

ARABIS STRICTA. *Upright Arabis, or rough Wall-creffe.* The rocks on the Leigh side of the river. March to May.

ARENARIA RUBRA. *Purple flowered Chick-weed, Sandwort, or sea Spurry.* By the river side. June to August. Fl. Dan. 740.

ARENARIA TENUIFOLIA. *Fine-leav'd Chick-weed, or Sandwort.* Foot of St. Vincent's rock. June, and July. Fl. Dan. 389.

ASPARAGUS OFFICINALIS. *Common Sparagus.* Meadow below Cook's Folly. July, and August. Fl. Dan. 805.

ASPLENIUM CETERACH. *Spleenwort.* Common on walls. May to September. Bolton's Filices. Tab. 12.

ASPLENium RUTA MURARIA. *White Spleenwort, or Maidenhair.* Common on walls. June to September. Fl. Dan. 190.

BRYUM EXTINGCTORIUM. *Extinguisher, or conic Bryum.* Various places on St. Vincent's rocks. Oct. to Aug. following. Dillen: Hist. Musc. t. 45. fig. 8.

BRYUM POMIFORME. *Apple Bryum.* On the rocks in Leigh wood, rare. March, and April. Dillen: Hist. Musc. t. 44. fig. 1.

BULPEURUM TENUISSIMUM. *Least Thoroughwax, or Hare's ear.* In the meadows below Cook's-Folly. July, and Aug. Hist. Oxon. ix. 12. 4.

CARDUUS ACAULIS. *Dwarf Thistle.* St. Vincent's rock. July. Clus. 5th. book, page 156. fig. 1.

CARDUUS ERIOPHORUS. *Woolly-beaded Thistle* St. Vincent's rock. July. Clus. 5th. 154.

CHENOPODIUM MARITIMUM. *Sea Goosefoot.*
By the river side. August. Fl. Dan. 489.

CHLORA PERFOLIATA. *Perfoliate Yellow-wort.*
St. Vincent's rocks, and Leigh-wood. July. English Botany. pl. 60.

COCHLEARIA ANGLICA. *Sea Scurvy-grass.* By the river side. May. Fl. Dan. 329.

COTYLEDON UMBILICUS VENERIS. *Navel-wort, or wall Pennywort.* St. Vincent's rock, and walls about Bristol, very common. June to August. Clus. L. 4. 63. 1.

DIGITALIS PURPUREA. *Purple Fox-glove.* Leigh-wood, and near Cook's-Folly. July. Fl. Londinens. i. 2.

ERIGERON ACRE. *Blue Erigeron, or blue Fleabane.* St. Vincent's rock. July, and August. Fl. Londinens. i. 5.

EUPHORBIA EXIGUA. *Dwarf Spurge.* At the foot of St. Vincent's rock. July. Fl. Londinens. iv. 41.

GALEOPSIS LADANUM. *Red Dead-Nettle, or Nettle-hemp.* St. Vincent's rock. June to August. Rivin. Mon. 24.

GALIAM MONTANUM (Hudson) *Mountain Ladies-bedstraw.* St. Vincent's rock, near Clifton turnpike. July, and August.

GERANIUM MARITIMUM. *Sea Crane's-bill.* By the river side. June, and July.

GERANIUM SANGUINEUM. *Bloody Crane's-bill.* St. Vincent's rock, common. July, and August. Walcot. Fl. Brit. indig.

GLAUX MARITIMA. *Sea Milkwort, or black Saltwort.* By the river side. June, and July. English Botany. pl. 13.

HIPPOCREPIS COMOSA. *Tufted horse-shoe*
Ketch. Near Giant's-hole. July. English Bo-
 tany, pl. 31.

HYPERICUM HUMIFUSUM. *Trailing St. John's-*
wort. Clifton turnpike. July. Flor. Londin.
 iii. 28.

HYPERICUM MONTANUM. *Mountain St. John's-*
wort. Clifton turnpike. July. Fl. Dan. 173.

HYPERICUM PULCHRUM. *Elegant, or up-*
right St. John's-wort. St. Vincent's rock, below
 Clifton Turnpike. July. Flor. Londinens. i. i.

HYPNUM CRISPUM. *Curled Hypnum.* St.
 Vincent's rock. March. Dillen. t. 36. fig. 12.

GENTIANA AMARELLA. *Autumnal Gentian, or*
Feltwort. Leigh-wood. July, and August. Fl.
 Dan. t. 328.

LATHRÆA SQUAMMARIA. *Toothwort*. *High-wood*. April, and May. English Botany, pl. 503.

LEPIDIDIUM PETRÆUM. *Mountain Pepper-wort*. Various places on St. Vincent's rocks. April, and May. Jacq. Auft. t. 131.

LEPIDIDIUM RUDERALE. *Narrow-leaved Pepper-wort, or Dittander*. At the foot of St. Vincent's rocks. June, and July.

LICHEN DEUSTUS. *Sooty Lichen*. The further end of St. Vincent's rocks. All the year. Dillen. t. 29. fig. 117.

LICHEN MINIATUS. *Cloudy Lichen*. With the above. All the year. Dillen. t. 30. fig. 127.

LICHEN POLLYRHIZUS. *Dusky rock-lichen*. With the above. All the year. Dillen. t. 30. fig. 129.

LITHOSPERMUM OFFICINALE. *Common Ground-well*. May, and June.

MILIUM LENDIGERUM. *Pink fox-tail Grass.*
Near the New Hotwell. July, and August.
Schreber. t. 23. fig. 3.

MONOTROPA HYPOPITHIS. *Primrose-scented Hypopithis, yellow Monotropa, or Bird's-nest.* In Leigh-wood. July. Eng. Botany, pl. 69.

OPHRYS APIFERA. *Bee Ophrys.* St. Vincent's rock, behind the New Hotwell. July, and August. Fl. Londinens. i. 3.

OPHRYS MUSCIFERA. *Fly Ophrys.* With the former. July, and August. English Botany, pl. 64.

OPHRYS OVATA. *Common Ophrys, or Tway-blade.* Leigh-wood. May, and June. Fl. Londinens. iii. 30.

OPHRYS SPIRALIS. *Triple Ophrys, or Ladies' trices.* St. Vincent's rock, above the Hotwell-house. July, and Aug. Fl. Lond. iv. 46.

ORCHIS BIFOLIA. *Butterfly Orchis*. Leigh-wood. May to June. English Botany, pl. 22.

ORNITHOPUS PERPUSILLUS. *Birds-foot*. Brandon-hill. near Clifton. August. Fl. Londinens.

OSMUNDA SPICANS. *Spleen-wort, or Osmund royal*. Below the Hotwell, and in Leigh-wood. August. Bolton's Filices. tab. 6.

PEUCEDANUM SILAUS. *Meadow Saxifrage*. Leigh-wood side of the river. August. Flor. Austriaca. t. 15.

PICRIS ECHIOIDES. *Ox's-tongue, or rough Picris*. Below Cook's Folly. July, and August. Flor Londinens. iii. 25.

PICRIS HIERACIOIDES. *Yellow Picris, or Succory*. Below Cook's Folly. July, and August.

PIMPINELLA DIOICA. *Least Pimpernell, or Burnet Saxifrage*. On St. Vincent's rock, behind
the

the Hotwell-house. May, and June. Flor. Auf-
triaca. t. 28.

POLYPODIUM DRYOPTERIS. *Branched Polypody.* In Leigh-wood, rare. June to September. Bolton's Filices, tab. 28.

POLYPODIUM FRAGILE. *Brittle Polypody.* In Leighwood with the former, rare. June to September. Bolton's Filices, tab. 27.

PRENANTHES MURALIS. *Wall Lettuce, Ivy-leaved wild Lettuce, or Wall Prenanthes.* Leighwood. July. Flor. Londinens. v. 52.

POTERIUM SANGUISORBA. *Common Burnet.* St. Vincent's rock. July. Flor. Londinens. ñ. 15.

POTENTILLA VERNA. *Spring Cinquefoil.* St. Vincent's rock. May, and June. English Botany, pl. 37.

RUBIA PEREGRINA. *Wild Madder.* St. Vincent's rock, and Leigh-wood. June, and July.

SALICORNIA HERBACEA. *Marsh-Samphire, jointed Glass-wort, or Salt-wort.* On the banks of the river. August, and September. Flor. Danic. t. 303.

SCABIOSA COLUMBARIA. *Small Scabious.* St. Vincent's rock. June, and July. Walcot. Fl. Brit. indig.

SCILLA AUTUMNALIS. *Autumnal Squill, or Star-byacinth.* Near the Limekiln, on Clifton-hill. August, and September. Clusius, p. 181.

SEDUM DASYPHYLLUM. *Round-leaved Stone-crop.* St. Vincent's rock, in the road to Giant's hole. July. Flor. Londinens. iii. 25.

SEDUM RUPESTRE. *St. Vincent's-rock Stone-crop.* In the road to Giant's-hole. August.

SISYMBRIUM MURALE, Linnæi; BRASSICA MURALIS, Hudsoni. *Wall-Cabbage, or Wild Rocket.* Various places. May to September. Fl. Londinens. iii. 27.

SMYRNIUM OLUSATRUM. *Alexanders.* near Giant's-hole. May, and June.

SOLIDAGO VIRGAUREA. *Golden-rod.* St. Vincent's rock. August. Fl. Dan. 663.

TRIFOLIUM ORNITHOPOIDES. *Bird's-foot Trefoil.* St. Vincent's rock. June, and July. Fl. Londinens. ii. 21.

TRIFOLIUM SUBTERRANEUM. *Dwarf Trefoil.* St. Vincent's rock. May. Fl. Londinens. ii. 22.

TURRITIS HIRSUTA. *Hairy, or Rough tower Mustard.* Wall behind the Hotwell-house. June. Jacquin, *Plant. rariores.*

VERONICA SPICATA. *Spiked Speedwell.* In the way to Giant's-hole. June to August. English Botany; pl. 2.

VIOLA HIRTA. *Hairy Violet.* St. Vincent's rock, near the turnpike. March; and April. Fl. Londinens. i. 10.

ULVA LACTUCA. *Lettuce Laver, or Oyster Green.* On the banks of the river. September to May following. Dillen: t. 8. fig. 1.

APPARENT, AND CHEMICAL CHARACTERS.

THE APPARENT.

DRAWN from the cock into one of the usual glasses of the pump-room, it appears beautifully brilliant; and, till it is cold, abundance of bubbles

bles bound through it. Some have supposed this to be an effervescence depending on an impregnation that takes place only on exposure to atmospheric air. I should rather imagine these bubbles were rarefactions of fixt air, or of its peculiar unfixable gas, perhaps of both, which cease with the warmth of the water.

WHEN a large volume however of the water is looked through, as when it is contained in a globular decanter of half a gallon, a milky hue is very perceptible; if contrasted with the same quantity of any good spring water, it is still more evident.

It is warm, smooth, and pleasant immediately drunk, yet having no decided taste: after some minutes it leaves on the tongue a slight astringent sensation.

I HAVE constantly found it quite devoid of odour; although some pretend to detect in it a calcareous smell, as that of lime-water.

IMMERSING the thermometer into it at various seasons, and in various temperatures of the atmosphere, I have never found that it was raised beyond 76° of Fahrenheit's scale. Some books improperly make its warmth 80°. With this mistake is connected the false idea of the spring having now less heat than formerly. The inaccurate construction, and injudicious use of thermometers, in earlier times, may have contributed towards the error.

Its specific gravity, taken immediately from the pump, is nearly as that of distilled water, and always less than that of the best common cold springs. On standing, its weight somewhat diminishes.

ON exposure in an open vessel, even for a short time, some corpuscles are seen floating in it; and at length a sediment appears. This at any rate evinces the necessity of drinking it at the spring, to have it in its utmost native purity; whether we attribute the change to a facility of decomposition

in the atmospheric air, or to matter received from atmospheric air by an inherent ready attraction peculiar to itself.

It freezes less readily than any other water; and, according to Dr. Keir, its congelation begins at the bottom of the vessel in regular crystallizations; whereas that of rain water begins on the surface, and continues in an exact inverse degree, crystalizing more irregularly.

This water, even moderately secured from the exterior air, will retain its purity and sweetness in all climates longer than any other known. Distilled water, and indeed that of all tolerably pure springs, will, hermetically sealed, remain good for a century at least; the *Aqua felice* the purest water of Rome has evinced this. It is further confirmed by the annual hogsheds, to the amount of thousands, sent to the East and West Indies, particularly the latter, where it is used as a luxury in the making of sherbet, punch, and such liquors. It is similarly employed in this climate. And we

have

have it on record, in Lord Anson's voyage, that it may be carried unspoiled round the globe. The European consumption of this water for the like purposes of indulgence, as well as medicinal, is immense, and ought to afford an ample income to its renters.

THE CHEMICAL,

HAVING gone through the usual routine of chemical experiment, I do not find pretensions to throw any new lights on the nature of this water, or to have discovered any new principle that will heighten its reputation. It is of no difficult analysis. Its contents are well known; so are the medical properties of those contents; and the variation in quantity, according to the experiments of different chemists, is so immaterial, as not to deserve a comment.

I SHALL not here dwell on analytical minutiae, but shall give one general survey of the effects produced

duced by some of the more material tests on these waters, deducing an inference from the whole.

RESPECTING the investigation by evaporation I shall be equally curfory: the relation of such processes are interesting to the chemist only: the generality of readers will be content with the result, which they shall have in a comparative view from different operators.

TESTS.	EFFECTS.
Astringents.	Colour unchanged.
Fixed alkalies in a solid, or fluid form.	Slight effervescence—Milky appearance—Sediment—Brightened on standing.
Volatile alkalies solid, or fluid.	Effervescence scarce perceptible—Deepened on standing.
Fossil, and vegetable acids.	Brisk effervescence.
Solution of Hydrargyrus muriatus.	No change.
Solution of silver in nitrous acid.	Opacity, deepening by degrees to a bluish purple.
Lead in nitrous acid.	The same.
Mercury in nitrous acid.	Yellow cloud, and precipitate.
Solution of Cerussa acetata.	White adhesive cloud
Tincture of steel, and of logwood.	No change.
Syrup of violets.	Varying green.
Solution of soap.	Milky — Opake — Grumous.

HENCE

HENCE it is evident, that this water possesses no ferruginous principle, that it is alkaline, and contains some portion of vitriolic acid.

THE water being boiled, it will form a smooth mixture with soap; and its effects with acids and alkalies will not take place.

MILK boiled with it will not be decomposed.

EVAPORATING a gallon of this water, it soon grew turbid; an effluvia arose, condensing itself in a whitish matter about the edge of the vessel, while a seeming earthy deposit formed. When it was reduced to two or three ounces, it shewed strong signs of salinity; and, when evaporated to dryness, I had an ash-coloured residuum weighing 52 grains. We will compare this with the products of some others, who have analyzed the same quantity.

Dr. Guidot from one gallon of Hot- well water got a residuum of	-	50 Grains.
Dr. Wynter	-	36
Dr. Keir	-	34
Mr. Shebbeare	-	56
Dr. Rutty	-	50
Dr. Sutherland	-	nearly 41
Dr. Higgins	-	57
My own process	-	52

THE mean of all these products would be 47 grains; but I should rather trust to the well-known accuracy of Dr. Higgins for coming nearer the truth.

THIS residuum effervesced with acids, produced no effect with alkalies, turned syrup of violets green, and decrepitated a little on a hot iron.

By solution, filtration, evaporation, and crystallization, I procured 10 grains of what I supposed saline matter from my 52 grains of product. On examining the crystallization through a glass,

it seemed chiefly composed of cubic crystals ; there were a few long, and hexagonal. Let this be compared with what others have made out to be the relative proportions of the saline and earthy parts of the residuum.

Dr. Guidot says, the saline is to

the earthy part as	-	-	1	to	4
Dr. Wynter	-	-	1	—	5
Dr. Keir	-	-	11	—	15
Dr. Shebbeare	-	-	11	—	13
Dr. Sutherland	-	-	44	—	56
Dr. Higgins seems to con-					
sider it as	-	-	12	—	42
My own process makes it as	-		10	—	42

THE mean of all these relations would be in the ratio of 1 to 2, which however appears to me not the just proportion.

FROM my investigation of this water in its fluid form, and from the residuum on evaporation, I would believe that it contained in various combination,

nation, but in what exact proportion my experiments were not calculated to decide, the following contents: vitriolic acid, aerial acid, a peculiar gas holding calx in most intimate solution, marine salt in large proportion, nitre in smaller proportion, and calcareous earth.

THE opinions of former chemical operators, respecting the constituent principles of the Hotwell water, we will exhibit.

DR. GUIDOT maintains the contents of the water to be iron, a nitro-sulphureous salt, some limestone, and possibly alum.

DR. WYNTER attributes to the water chalk, lapis calcarius and calaminaris, also lixivial salt.

DR. KEIR gives it nitre, sea salt, and an alkaline earth partly held in solution by a peculiar acid which chemistry is not able to detect.

MR. SHEBBEARE acknowledges alum, and lime in the act of flaking.

DR. SUTHERLAND positively affirms the principles that constitute the water to be: the spirit, the pure element, a vitriolic acid, a marine acid, a neutral salt, and an absorbent earth.

DR. HIGGINS, on whose analysis I confide, says that it contains selenite, much acidulous gas a part of which holds calcareous earth in suspension, atmospheric air, muriated magnesia, and marine salt.

THE Hotwell water on distillation resembles any common spring water distilled, the residuum is the same as on evaporation, which will never homogeneously reunite with the fluid it has quitted; a proof that some subtile combining principle escapes, which, according to Monro, turns during the operation a luting of blue paper to a purple.

SOME writers have given the effects of like experiments on other springs in the neighbourhood of St. Vincent's rock, to prove that they are all dissimilar to the Hotwell Spring. This is unnecessary, and we will take the fact on their faith; but we must except those springs at the former Well-house, a full mile distant down the river: they are exactly similar to, and no doubt are a part of the same warm current that supplies the present Hotwell. They fell into disuse by reason of their remoteness from any habitable situations, which occasioned the establishment of the present Well-house.

It may be asked, whether there be any artificial combination that will supply the place of this water. Dr. Keir has indeed proposed to saturate powdered quick-lime with vitriolic acid, and to impregnate water with it, to this end. Yet a water whose solid contents are so small, and whose efficacy perhaps solely depends on that subtle transient principle which combines them, cannot, I should imagine, be artificially imitated with any degree

degree of success, as the Pyrmont, Cheltenham, Tunbridge, and other waters may, whose component parts are somewhat more determined.

DR. ALSTON observes, that lime-water, made of 5 or 600 parts water to 1 part lime, will be as strong, and as medicinally efficacious, as that made of 1 part water, and 10 parts lime; for well calcined lime will impregnate 15 or 1800 times its own weight of water. And he adds, that a gallon of Bristol water is saturated with calcareous contents nearly in this proportion.

CHEMISTRY has of late years undergone such philosophic mutation and refinement, that it has taught us to believe, or at least to expect, that every mineral water, if its principles are once known, can be correctly and effectually compounded. But let not the enthusiasm of science betray us into error: principles separately trifling, and inert, when combined and modified by nature, according to hidden laws which elude all

art, will become active beyond the power of imitation.

NEW DISCOVERED HOT SPRING.
AT CLIFTON.

It may perhaps be expected in this place, that I should take some notice of the hot spring newly discovered on Clifton hill. I can by no means with candour, or propriety make any decision upon its merits at present. Future investigation, and, above all, a series of success in the exhibition must determine its value.

THE water, raised by a fire-engine, certainly now proves of great utility to the inhabitants of Clifton, which is deficient in springs, for purposes of domestic œconomy. And when experience shall have sufficiently confirmed its virtues, and warranted its medicinal application, it may prove

both salutary and convenient to the invalids resident on the hill.

THE origin of this water excites attention and inquiry. The proprietor assures me, that the depth from the surface of the well on his ground to the source itself is 40 fathom, and that it is far below the spring of the present Hotwells. Now the level of the water at the former Well-house down the river, which rises at three distinct contiguous sources of easy access, is much above that of the present Well-house; we may therefore reasonably infer, that it is one and the same hot stream which runs in a gradual descent from the old Wells to the new-discovered spring, breaking out in its way at the present Wells.

Its temperature within the well, on the credit of a person who went down to the spring when it was first discovered, and immersed two different thermometers, was 66° of Fahrenheit's scale. He also observed, that it broke out of the ground in a horizontal direction, due E.

IMMEDIATELY as drawn out of the well, and come within our atmosphere, it also raises the thermometer to 66°.

Its specific gravity in the hydrostatic balance is as that of the present Hotwells.

HEAT OF MINERAL WATERS:

WHETHER it be the decomposition of martial pyrites near the earth's surface, or whether it be deeper subterranean fires that give warmth to mineral springs has long agitated the speculations of philosophy. I mean not to hazard a conjecture upon it; and mention it only to give some of my less informed readers the favourite principles on which the heat of waters is believed to depend.

THE nucleus of this globe has been thought a central sun, or mass of fire, to vivify its productions from within, as our known sun does from

H without.

without. Indeed that constant equable heat, which characterizes mineral waters, seems to depend on some very permanent principle. Were decomposition the cause; the mass of matter to be decomposed must in time be exhausted; and did it depend on the decomposition of pyrites, a sulphureous, or ferruginous quality would probably belong to all warm mineral springs. But these objections admit of much argument; and on their refutation might be established hypotheses without end.

CERTAIN it is, that in a great drought, when the generality of springs are exhausted, mineral springs still flow the same. In the hot summer of 1780, Dr. Darwin relates, that when every neighbouring source was dry, those of Buxton and Matlock were not diminished. The greater convulsions of nature also affect mineral springs chiefly. The day of the noted earthquake at Lisbon, it is reported, that our Hotwell water became so suddenly turbid it could not be drunk, and continued thus for some time. These are
proofs

proofs of a connexion deep in the womb of earth.

THERE is a thermometrical observation made relative to the common springs of countries, which, if it be just, is a curious circumstance in natural history, and may assist in guiding us to a better knowledge of hot springs. It is; that wherever they are found, the mean temperature of the atmosphere of that place, taken from the average of measurements of the thermometer for a succession of years, will always be found exactly to correspond with the temperature of such springs.

THE waters on which the observations are made should be at some considerable depth in the ground, so as to be insensible to the action of sudden changes of the atmosphere: nothing is better than a common draw-well, 20 yards deep, or more. The thermometer should be read off whilst yet immersed in the water: A bucket of water drawn up will not change its temperature

H 2

sensibly

fenfibly in the time requisite to make the obfervation; but, if this be wanting, a cup may be lowered down by a packthread, placing the thermometer within the cup, letting it remain ten minutes at the bottom of the well, then haftily drawing it up, and instantly reading off the temperature. If a doubt exists whether the well be deep enough for the purpofe, I contrive to have the water in it left at reft for one or two days; then examine the temperature of the water near its furface, and again that from the bottom. It is ftill better, to repeat the fame trials under a warmer, and a colder atmofphere: and if in all thefe circumftances the mercury in the thermometer ftands at the fame degree, I am fatisfied that the well is proper for the purpofe, and that I have thus obtained the mean temperature of the climate.

MEDICAL THEORY OF THE OPERATION OF THE HOTWELL WATER.

Most writers on mineral waters have endeavoured to explain their action, by applying to their contents the established laws of mechanics, and the fallacious doctrines of chemistry: I say fallacious; for what faith can we place on a science, which acknowledges one great actuating principle to-day, denies its existence to-morrow, but possibly readmits it the next day? I allude to the revolution of *phlogiston*. Let those banish it who may: I am not inclined to discard this constant secret friend, who for years has prepared my daily food, and cheered me amidst the severities of winter. It may be alledged, that we have no other known principles than those of mechanics, and of chemistry to reason upon, in the present instance: I agree to it: and it is certainly fair, to submit whatever theories are plausible to our judgments and opinions, but they should by no means claim implicit belief: all hitherto advanced
for

for the illustration of our subject have, in my mind, been unsatisfactory; yet this ought not to repress the spirit and ingenuity of investigation. Analogy must guide our reasonings upon what is unknown, and actuated by hidden laws. We can argue but from our own changeful science on the operations of mineral waters, till the immutable chemistry of nature shall be understood, which alone can give us the true knowledge of them.

LET us examine the Hotwell water, by its separate principles in a general way, and according to old-established medical maxims.

Its subtile gas, and active aeriform impregnations adapt it to pervade the minutest canals of the human frame, even those undiscovered supposed passages in the nervous system. Hence, it resolves obstructions of the most remote existence; it dilates the capacities of the finer vessels, overcoming their spastic constrictions, which constituted a variety of disease. The antiseptic qua-

ities of aerial acid have been long acknowledged.

THE aqueous principle, of singular purity, holding no matter in suspension to which it has a peculiar attraction, as it passes whatever may be permeable, is capable of dissolving preternatural coagulations, impacted humours, or any thing of a mucilaginous nature, and of protruding them through different emunctories: for water is the natural vehicle of all nutritious mucilage, nay, it is a universal solvent.

THE salts, by their wedge-like crystalizations, split asunder all viscosities, infinitely dividing them: and their angular forms stimulate the passages to their immediate expulsion, or a previous absorption. By such gentle excitement, they also quicken a sluggish circulation, or remove whatever impedes it. We know the efficacy of vitriolic acid, of which some of the salts are composed, in restraining colliquative perspirations or hæmorrhages, and acting as a tonic. The anti-

leptic

septic power of marine acid, which composes others, we also know, and how capable it is of preventing the action of purulency.

THE terrene matter corrects all acidities of the primæ viæ; it absorbs all acrimonious humours of the habit; prevents their accumulation, and erosion of the blood-vessels, so as to create hæmorrhage; in which their native stypticity has also its effect: it involves the saline particles, enabling them to pass through the larger tubes of the body without effect, till they arrive at the smaller canals, where this terrene matter, unable from its grossness to pass, quits them; and the salts then act with their destined efficacy.

FROM such premises are deducible the utility of our water in phthisis. It prevents, or even resolves those serofulous obstructions of the infinitely minute glands, of the mucous membrane of the lungs, which possibly constitute tubercles. It corrects the septic matter of their suppurations, and carries it innoxious out of the constitution.

It

It prevents the hæmorrhage, when the sanguiferous system of the lungs is eroded from matter, or when ruptured from an increase of circulation there determined. And lastly it restrains the night sweats, and mitigates the fever.

WE may similarly infer its efficacy in diabetes. It passes so readily through the minutest outlets of our frame, as to divert thither the preternatural secretion of the kidneys. Its earth absorbs in part the redundant fluid, and, by an union with vitriolic acid, strengthens the relaxed secretory organ, to which it has a particular determination. But chiefly, a specific power it seems to possess allays thirst, the most tormenting of all its symptoms.

THESE doctrines well correspond at least with Dr. Randolph's scale of hectic fever, at the head of which appear, as primary causes, increased circulation, and relaxed glands.

DR. FOTHERGILL seems to lay a stress on dilution, as a principle by which this water acts:

copious draughts he considers of material use in washing off impurities, allaying heat, and supplying the waste of juices exhausted by copious perspiration. This theory of dilution is favoured by many ingenious physicians of the present day, with whom I have conversed on the subject of our water.

THUS may we be permitted to reason; and let us even allow validity to our hypotheses; till time; and human industry shall have discovered the more hidden springs of action.

APPLICATION TO DISEASES.

THE Bristol, like every other mineral water, has its too zealous advocates, who extol it as a specific in complaints, to which, in my opinion, it is no way adapted. I shall mention only two diseases, in which it is of approved, indubitable efficacy; *Phthisis*, and *Diabetes*. Yet my reader
 must

must not thence be led to a belief, that it is in those only I esteem it beneficial; it certainly has its utility in many others which are chronical, particularly all those that are connected with hectic fever, either as a cause, or a concomitant symptom.

PHTHISIS.

It would be unnecessary, and perhaps improper, to enter into the doctrines and dangers of phthisis with the miscellaneous valetudinarians, and unlearned in medicine, into whose hands my book may come; for them I write, not for the physician; and to such I ought only to point out how impending ill may be averted, or incipient mischief restrained, and where hope is to be expected from the exhibition of these waters. For this end I shall confine myself no further to the theory of the disease, than to explain those causes which may answer my intention.

I AM much inclined to favour the opinion of Dr. Radcliffe, as reported by Mead, that consumptions in this, and other cold countries, are mostly of strumous origin. Phthisis seems peculiar to insular situations, consequently to our country; and I have known persons obtain relief, merely by crossing over to the nearest continental situation, as Calais, Havre, or Ostend. Yet in certain localities on the continent the disease prevails, and in a singular way. At Hières, in the south of France, where many of our pulmonary invalids were used to emigrate, I asked a physician of the place what were the endemic diseases? he said, consumptions, and intermittent fevers. But this is accounted for, when we understand, that a neighbouring spot, which in the winter forms a beautiful lake, is in the summer a putrid exhaling marsh.

THE chief predisposing causes of phthisis are: an hereditary disposition; the age of between twenty and thirty, particularly in females; a tall stature; slender neck; flat chest; a clear red and
white

white complexion ; also, hilarity of temper ; and quick parts.

To whatever persons these causes may apply, let them have a jealous regard to the more immediate exciting causes, which principally are: indulgence in excess of passions, whether such as repress, or as exhilarate ; too strict attention to any sedentary employ ; late hours ; suppressed evacuations ; whether natural, as the menstrual, perspirable, hæmorrhoidal ; or artificial, as those of issues, and similar drains ; introverted matter, whether eruptive, ulcerous, or other ; breathing a tainted air, either by living within the influence of some unwholesome combustion, or in some impure locality ; sudden transitions from heat to cold, in point of atmosphere or apparel, this includes a want of attention to warm feet, and cloathing adapted to the season, which, if wet, must never be suffered to dry on the body ; damp beds ; exposure to the night air ; a humid atmosphere ; a parching wind : but of all causes least attended to, most to be dreaded, and above every other mischievous

chievous, is the common catarrhal cold, which perpetually occurs in our climate during the winter; it constitutes the first stage of maladies innumerable.

As sex, youth, and beauty, are in themselves material predisposing causes to the disease in question; so I would particularly direct the attention of my female readers to the circumstances I have just enumerated.

THE cure of incipient phthisis may sometimes be effected; that of the confirmed must be despaired of, till further ingenuity shall make discoveries now unthought of. Our Hotwell water materially mitigates the most distressing of its symptoms, the hectic; and frequency of mitigation we know will sometimes accomplish a cure. Nor let us doubt its utility, when a water so devoid of principle as that of Malvern is deemed serviceable in consumption, on the respectable authority of the late ingenious Dr. Wall, of Worcester: he relates some well authenticated cases

cases of its virtues. And here I cannot but express my regret, at seeing patients so often visit our waters in that late period of the disease, when no remedy, no human skill can avail; when mischief is so thoroughly confirmed, that even palliation cannot be hoped. Where tubercles are only incipient, not suppurated, advantage may accrue from our Hot-spring.

BUT the water alone will not suffice; the collateral aid of remedies is almost always requisite, to obviate symptoms as they arise, or to produce some general change in the animal œconomy. Blisters, issues, and setons are powerful assistants; so is blood-letting, although it is too frequently abused. Opium, and certain neutral salts, particularly of the refrigerant kind, do undoubted good. Hemlock, mercury, and the balsamic gums are of dubious efficacy. The squill, though condemned by so competent a judge as Fothergill, certainly has its use. Bark, and steel require more of our consideration in this complaint than, in my opinion, they have yet had; but
 their

their exhibition requires skill: the one, under due management, may influence, so as to mitigate, the exacerbation of wasting hectic;* the other may have its effect on early tubercles. Affes' milk is often serviceable: goats' milk is likewise esteemed so: cows milk, taken so as to constitute what is called a milk diet, I have my doubts upon. And riding on horseback, so as not to fatigue, is of sovereign use; Sydenham asserts, that it is as unfailing in consumption, when curable, as Peruvian bark is in an intermittent.

A CERTAIN *Syrup* having of late obtained so much fame in the cure of this disease, it may seem to require mention. Many whose cases were hopeless have, through inclination, or the persuasion of friends, been induced to try that harmless

* WHERE a light and manageable preparation of the *Cortex*, seems indicated, in delicate cases, I have exhibited with success that newly-invented by Godfrey, under the name of *Essential Salt of Bark*. It obviates the usual inconveniences of this remedy. The dose is from four to ten grains; and its best vehicle is the *Mistura salinosa*, or *Lact amygdalæ*.

farrago of unmeaning herbs; I never opposed its trial; and have always found it equally innoxious, and ineffectual: but I have constantly objected to the rude preparatory purgative, which the inventor advises should precede its use; to the delicate pulmonic patient I have judged it highly prejudicial.

How far consumption is catching agitates the mind of many a friend attendant on the unfortunate. As I do not consider the matter of suppurated lungs as a specific contagion, so I think it cannot positively be communicated. Whether the air of a room be contaminated with the purulent effluvia of pulmonic ulceration, or of a suppurating sore of any other part of the body, it will be equally injurious to the health of attendants; and as such attendants are most often relatives of the sick, and possibly predisposed by inheritance to the same disease, so they more readily than others may have their lungs affected by the effluvia of matter. Perhaps also matter breathed from the lungs may be more largely and intimately

ly diffused through the air, than if it exhaled from an open ulcer, and was simply absorbed; hence it affects with greater facility. Were the matter of consumption a specific poison *sui generis*, a mortality must frequently prevail among our Hotwell nurses.

THE species of phthisis in which the water appears more particularly useful are those arising from hæmoptoe, or from tubercles; and they are by far the greater number which seek relief from the Hotwell spring. Females are more particularly disposed to the phthisis hæmoptoica, from circumstances peculiar to their œconomy: with them there is less to be dreaded; nature, or gentle emmenagogues often effect a cure; and the Hotwell water, restraining for a time the momentum of circulation, allows the mouths of the ruptured vessels to collapse and heal without further injury.*

* In this species of phthisis I have given the *Lichen Islandicus* with singular advantage. It is subastringent, and mildly tonic; it is mucilaginous, and nutritive. It appears to unite the qualities of many medicines commonly employed in the disease, as infusion of roses, gum arabic, and others.

IN the arthritic, syphilitic, asthmatic, and scorbutic phthifis it has little effect; to the last of these bark, and the expressed juice of the *sum* I have found somewhat serviceable; although in every phthifical case, as far as hectic fever is concerned, the Bristol water has its use as a palliative. In the true marasmus it is of no avail.

DIABETES.

I shall say the less on diabetes, as its doctrine is professedly not understood. The ancients scarce knew the disorder. From the time of Aretæus, who first marked it as a distinct disease, it has been attributed to an extreme want of tone, and perhaps an irritability in the secretory organ, arising from an undue exertion of its functions; but all writers allow some more remote primary origin, depending on constitution, that we are totally unacquainted with.

THERE are two theories, whose novelty and singularity render them deserving of mention, and the latter I am much inclined to favour.

THE first is Dr. Mead's. He calls diabetes a disease of the liver; owing to a decomposition of those salts of the bile, which ought to assimilate its oleaginous with its aqueous parts: by drinking largely they are dissolved, carried to the kidneys the great emunctories of ingested fluids, stimulate them to increased action, and produce the complaint; while the oleaginous parts are deposited in the liver, which is in consequence diseased. The dissection of diabetical persons, who are generally drunkards, and have diseased livers, may in some degree have given rise to this doctrine.

THE second is that of the late Mr. Charles Darwin; who imagines diabetes to proceed from a retrograde action of certain lymphatics, which absorb and introvert the chyle towards the urinary passages, depriving the body of its due nurture. This to me so thoroughly accounts for the thirst, dry skin, emaciation, and urine loaded with saccharine matter oftentimes to such a degree that a mass of sugar has been formed by evaporating it, in short for every other symptom of the disease;

that

that I am almost satisfied with the merit of the theory: but this is not a place to assert its pretensions, or refute the objections made to it.

I will proceed to the causes of diabetes. “Evoe, attend ye bacchanalians!” Among the chief is an excessive indulgence in strong liquors, but principally those of a diuretic quality, as hock, gin, cyder, cool-tankard, and punch; more especially if drunk when the body is heated, when cold seasons diminish the perspirable matter, and when age produces atony. An improper use of mineral waters, particularly the Knareborough, is said to have brought it on; so has opium, copaiva balsam, and cantharides unadvisedly taken by the licentious. In short all diuretics, whether dietetic, or medicinal, largely employed, have occasioned it in predisposed persons.

SUDDEN transitions from heat to cold, hard exercise, immoderate venery, lumbar strains, sudden copious evacuations, intermittent fever, in-

anition,

anition, cachexy, some of the depressing passions, and the bite of a viper are accounted causes.

I have often remarked, that persons afflicted with diabetes are for the most part fair, florid, of a temperament apparently sanguineous, and not infrequently robust.

THE cure of diabetes is always tedious, often uncertain; Dr. Cullen speaks doubtingly of it; in Scotland at least he never knew it effected. May not this be owing to the unfavourable circumstance of cold in that climate? The fatality of this complaint is possibly owing to our early neglect of it. A sudden flow of urine happens on such frequent occasions, that we are little apt to notice its degenerating into a vice, and constituting disease, till the habit becomes troublesome.

BARK; lime-water; cantharides; alum-whey; antimonial diaphoretics; with rhubarb and ipecacuanha, sometimes conjoined, sometimes separate; all answering their several intentions, are
what

what I have found most efficacious in point of medicine.

OF concomitant aids the principal are: dry frictions; a nutritive incaffating diet; moderate exercife on horfeback; but above all tepid bathing, particularly in a fea-bath: this laft experience has induced me to lay fome ftrefs upon. Dr. Guidot, mentioning the cure of diabetes by Briftol water, feemed aware of its value; an idea which Dr. Randolph, quoting him, rather ridicules.

BRISTOL water, which, independent of its other virtues, I confider as a light lime-water, has of itfelf often cured diabetes; infomuch that it has been long eftimated its fpecific; yet in this inftance the concomitant aids were not neglected. But medicine is moft often neceffary to the cure: I have known the water alone drunk during four months, without anfwering any good end, till affifted by a very little medicine, when it has im-

mediately

mediately proved efficacious, and eventually cured.

THE use of the water in gleans, diarrhæas, and other fluxus, I have reason to doubt ; and esteem it no otherwise useful in nephritic complaints, than as a fluid that passes very readily : yet will I not presume formally to refute what its earliest and latest writers have constantly affirmed.

EXHIBITION, APPROPRIATE REGIMEN, AND CONDUCT.

The Exhibition of this water does not require much previous preparation, yet a mild aperient is generally adviseable : by cleansing the *primæ viæ*, it prepares them for its more efficacious action ; prevents any disagreement which would occasion unmerited disgust ; and it removes that increase of feverish heat, which travelling might occasion in the invalid coming from afar, who ought not to begin

begin the course till two days at soonest after arriving at the Wells.

The Time of drinking the water is usually before breakfast, and between breakfast and dinner; but neither meal should occur within an hour of taking it. A third time in the day is seldom advised. The morning draught is more particularly salutary, especially in summer, as the volatile principles of all mineral waters escape sooner in a warm than in a cold atmosphere; and some evaporation will always take place, even during the short space of time in which the glass is filled, brought to the lips, and drunk.

TWICE in the month, at new and full moon, some irregularity must occur in the time of taking the waters, by reason of the spring tides, which, rising higher than the ordinary tides, and coming at that time only on a level with some undiscoverable flaw in the inclosure of the Hot-source, enter it, and for a while render it brackish; but, by the

reflux of the tide, and much pumping, the source resumes its purity.

AN account of the progress of change in the water, during the springs, may prove acceptable.

About three days upon an average previous to the new and full moon, the water is disturbed, and unfit to drink; at what particular hour this happens is uncertain; in about four hours it becomes, with the assistance of pumping, pure again; this disturbance happens from 20 to 30 minutes later every day, till 3 days after the new and full moon; when it ceases with the spring or high tides, which have lasted, as they generally do, seven days.

IN this place, I might with propriety mention the good effects that would result from keeping the pump at all times going, whether the water be drinkable or not: the friction would preserve the cylinder of the pump in a constant warm state, and render the fluid of an equal temperature; a
circumstance

circumstance pleasing to the invalid, and creditable to the water.

The Quantity of water to be drunk is in general so much as will not cause any disagreeable distention of the stomach; therefore the tone of that organ, the strength, age, and temperature of the patient must regulate this. From four ounces to half a pint is the usual draught. There are three sized glasses at the pump-room; the largest contains half a pint, the second one third of a pint, and the smallest a quarter of a pint. Two glasses are generally taken at a time, twenty or thirty minutes being interposed between each. It is always best to begin with a quantity of water, rather under what we imagine may agree; a gradual increase of the dose has its advantages; and, where, from weakness and irritability of the alimentary canal, disagreement is suspected, it is best to take only one glass. Persons much debilitated, and under the age of fourteen, should always begin with the smallest sized glass; adults with the second sized; and even the most robust

of those, who enter on a course of the water, had better not take the full-sized glafs till the second or third day.

Drinking it at the Fountain-head I would strongly urge in the use of this water ; taken from thence I conceive it no longer to possess any medicinal power : I have had occasion to lay a stress upon this more than once in the preceding pages, assigning my reasons. Many persons, because the Bath water of more determined impregnation, being carried warm to some distance from the pump, will yet retain much of its virtue; have imagined that the Bristol water might remain efficacious in the same manner: but the contrary, I believe, is the case. Drunk at the table in any way as a beverage it is an agreeable luxury, but by no means a medicine.

The Season for the use of the water is in the latter end of spring, and throughout the summer; or, from the middle of May till the latter end of September; it might however be drunk as early as
April,

April, and as late as October; but this must depend on the temperature, and earlier or later setting in of the spring, as well as on the constitution of the summer. Not but the water, like that of all other mineral springs, is equally good in every season, with respect to its impregnations; but, in the finer months, the concomitant advantages of air and exercise are more attainable.

THE sea coast, particularly the Devonshire, is resorted to in the autumn by our visitants of all denominations. Valetudinarians, who have derived benefit from this place, are advantageously prepared for the more tonic remedy of a perfect sea-air. To the idle, or the speculative, the sea coast, particularly the western, affords from its numerous towns, each on the mouth of some river, a charming and interesting variety.

The immediate sensible Effects that are perceived on first drinking the Bristol water require mention; lest the uninformed should too hastily conclude,
that

that it disagrees, and unadvisedly deprive themselves of a valuable remedy they have perhaps travelled miles to obtain. The effects vary according to different idiosyncrasies, or peculiarities of constitution; the most general however are: drowfiness, vertigo, and sometimes an obtuse pain in the head: these may be accounted for on the principle by which Dr. Wall accounts for the same effects in the Malvern waters, namely a temporary plethora, occasioned by the ready passage of the water into the system; some gentle evacuants, with now and then antispasmodics, relieve. Oftentimes diarrhæa, sometimes constipation, are produced, which a few grains of ipecacuanha or of rhubarb remedy; but many are in that case obliged to take an absorbent aromatic powder in each dose of the water. Dejection, languor, and an imagined increased debility are also effects: stimulating cordials obviate them.

INVALIDS who drink mineral waters, depending upon, and guided only by their own judgments, may make trial of this with greater impunity than
of

of any other mineral water whatever. But let not its innocence lead us to consider it as inefficacious, and nugatory. Things trifling in themselves, under peculiar circumstances, become active, and material. And, if this water, drunk in large quantity by any one of rude health, produces, as it often will do, sensible effects; ought we not reasonably to conclude, that taken in small quantity by persons of extreme susceptibility, and of delicate health, it may become a powerful agent?

A fair Trial is accounted given to the Hotwell water, when it has been continued six weeks; if in that time it proves serviceable, it may be continued for months with advantage. Great good effects have been perceived from it, long after the course was over, during which only small benefit seemed to accrue!

Diet, and Regimen of any particular kind cannot be attached to a course of this water; they must be conformable to the disease present. The diabetical require an incaffating diet, the pulmonic

one that is cooling and abstemious. Phthisis being the most frequent Hotwell case, in which a stress is laid on dietetic aid, and as it coincides with that diet requisite in all cases connected with increase of circulation; so I shall consider a diet, and regimen light, soft, mildly nutritive, and bordering on the antiphlogistic, as in general appropriate to a course of the Bristol water.

VEGETABLES should constitute the principle aliment, avoiding such as in peculiar constitutions will occasion peculiar inconveniencies: the acescent fruits are in general good, as are all those denominated horary or summer fruits.

WHEN animal food may be allowed, which should always be with caution and sparingly; I would confine it to mutton, poultry, rabbit, and game of any kind: these are certainly of the most easy digestion. Fish is injudiciously, though commonly esteemed innocent: every person in health, who makes a meal on fish alone, may judge of its heating quality from the thirst it occasions: of
 sea-

sea-fish the whiting is least harmful; of fresh water-fish the flounder, as being the most readily soluble in the stomach: shell-fish may almost always be admitted; and turtle simply drest without its usual high seasoning is even esteemed of service: the French physicians pretend to cure consumption with the soup of land-tortoise only. Milk in general is ill borne by the stomachs of pulmonic persons: asses' milk is oftentimes found too rich, unless diluted with Bristol water; yet I would always employ it once in the day, and that early. All vinous liquors, or such as have undergone fermentation, should be abstained from; but here exceptions often occur: in debilitated habits I have known the diurnal exacerbations of hectic mitigated by a regular glass of port wine diluted taken during the intermissions, in the same manner as by bark. Riding with warm clothing according to the season, particularly of the lower extremities, and of the chest, demand strict attention.

STILL better to explain how far the water, exercise, diet, and medicine, may concur in forming one general scheme of regimen ; I shall point out the daily distribution of hours proper to be observed by an invalid, whom we will suppose in no desperate situation, and capable of profiting by every advantage conducive to recovery : we will also suppose that, some alterative plan being pursued, medicine is exhibited twice a day at medical hours : on going to rest medicine is almost always necessary : and we will place our patient in the usual Hotwell season. This scheme may be called

THE INVALID'S DAY.

AT six in the morning take asses' milk, diluted, or otherwise—Rest about an hour after it in bed : should perspiration ensue, which is frequently the case, rest rather upon the bed, lightly clad—Rise at seven, or earlier—Be at the Wells by half past seven—there take the first glass of water ; and, having walked in the open air, if weather permits,

mits, otherwise under the colonade, for ~~twenty~~ or thirty minutes, take the second glass—Ride on horseback, or in a carriage from eight to nine — Breakfast, and the private avocations of the morning will engage till—twelve, when a customary medicine is to be taken—At one go to the waters, and drink two glasses in the same way as in the morning—From half past one ride on the downs, or elsewhere till—four. Dinner. Remain quiet after it, or perhaps repose on a couch till—six. Repeat the usual medicine—Half hour after six. Tea, or such habitual beverage—At seven walk; or, if debility forbids, ride—At eight, or soon after, be returned home—At nine, or soon after. Supper.—At eleven take the night medicine, and retire to rest.

ADVANTAGES OF SITUATION, RECREATIONS, ACCOMMODATIONS.

To no one spot in our kingdom can the valetudinarian fly, or can the physician consign his patient, for a re-establishment of health impaired by disease, where the purpose is more attainable, than in the neighbourhood of St. Vincent's rock. Besides the virtues of its spring, it affords many conducive recreations: the rides over those downs extending from the summits of the rocks on either side of the Avon, particularly the Gloucestershire, are singularly beautiful. The site of Kingweston is unequalled. The nature of the air breathed on those heights has been spoken of. Aslton, on the Somersetshire side, affords a medicinal luxury highly grateful to the hectic invalid: the village, three miles in length, is one continued bed of strawberries. The upland habitations on Clifton hill, during the summer, are delightful; and the sheltered situation of those round the Hotwells below

low afford a warm residence in winter, equal at least to the boasted coast of Devonshire; indeed it has one advantage over it, being free from its damp airs, and mizzling rains, always prejudicial to the pulmonic. Hence Bristol Wells have these few years past become a fashionable winter resort.

THE amusements of the place are numerous, and afford choice to the healthy. Balls and breakfasts are at the Wells; concerts, and plays at Bristol: nor are wanting the more social meetings, where cards and conversation prevail: these are all conducted with that decorous regularity in respect to hours, which is so material to those invalids who venture to indulge in evening diversions: such regularity is a circumstance we would ever recommend to the attention of the person presiding over our amusements. And in this place let me be allowed to lament, that the female invalids at the Hotwells, who are for the most part at that period of life when public entertainments have their peculiar relish, err in no one instance so much, as in the indulgence of dancing

dancing; an exercise most salutary to lungs that are sound, but as injurious to those that are unsound.

THE summer stranger [will find on Clifton hill abundance of comfortable dwellings; and a well-established extensive hotel, that of York house. There are some good lodging-houses at the Wells; but we have to regret, that there are not yet a sufficient number for the now numerous winter visitants: this want is however supplied by the accommodations which three excellent hotels furnish, that of the New inn; of the Long rooms; and of Gloucester house; at which are found apartments commodious, and even elegant.

THE END.

